

Serial Number:  
Applicants: Nguyen et al

Patent Application  
Navy Case Number: 84,830

What is claimed is:

1. Process for making chalcogenide glass of low optical loss comprising the steps of:

(a) disposing arsenic monochalcogenide precursor and at least one chalcogenide selected from the group consisting of sulfur, selenium, tellurium and mixtures thereof, at a hot section of an open distillation system;

(b) dynamically distilling under vacuum in an open system the arsenic monochalcogenide precursor and the at least one chalcogenide so that the arsenic monochalcogenide precursor and the at least one chalcogenide are deposited at a cold section of the open system; and

(c) homogenizing the distilled arsenic monochalcogenide precursor and the at least one chalcogenide while transformation from crystalline state to glassy state takes place.

2. The process of claim 1 wherein the open system is an elongated glass receptacle with an open end adjacent the cold section.

3. The process of claim 1 wherein said distilling step includes heating the precursor and the at least one chalcogenide to vaporize same and deposit same in solid form at the cold section of the open system

4. The process of claim 3 wherein the step of homogenizing is conducted at a temperature above 550°C whereby chalcogenide glass is formed.

5. The process of claim 1 wherein the step of distilling is carried out at a temperature below about 550°C and wherein dynamic distillation is carried out under vacuum.

6. The process of claim 1 which includes the step of reacting components of the chalcogenide precursor to form the precursor.

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7. The process of claim 6 wherein the step of reacting the precursor components is carried out at a temperature of 300°C to 450°C.

8. The process of claim 1 including the step of dynamically distilling the chalcogenide precursor in an open glass receptacle and then homogenizing the chalcogenide precursor and reacting same with a chalcogenide.

9. The process of claim 8 including the step of distilling the chalcogenide precursor in an open glass receptacle at a high distillation rate and reacting the precursor and the chalcogenide to form a chalcogenide glass.

10. The process of claim 9 wherein the step of reacting the chalcogenide precursor and the chalcogenide takes place in a closed glass receptacle and wherein the chalcogenide glass is of a uniform color.

11. A process for making arsenic sulfide glass of low optical loss comprising the steps of:

(a) placing arsenic monosulfide precursor in a glass receptacle;

(b) dynamically distilling under vacuum arsenic monosulfide precursor to make purified arsenic monosulfide precursor ;

(c) homogenizing purified arsenic monosulfide precursor;

(d) adding sulfur to purified arsenic monosulfide precursor;

(e) distilling, reacting and homogenizing purified arsenic monosulfide precursor with sulfur to form arsenic sulfide glass of low optical loss.

12. The process of claim 1 including the steps of dynamically distilling arsenic monosulfide precursor and sulfur at a rate of  $500-1500 \times 10^{-3} \text{ g/cm}^2 \cdot \text{sec}$  and homogenizing the resulting